

Duration: 3 Hours

[Max Marks:80]

- N.B. :** (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

- Q.1 Attempt any FOUR [20]
- a What are electro-negative gases? Why is breakdown strength higher in this gases than in other.
 - b Explain Paschen's law.
 - c "The potential at a point plays an important role in obtaining any information regarding the electrostatic field" Justify the statement.
 - d Explain thermal breakdown in solid dielectrics.
 - e Explain what is operating duty cycle test on a surge diverter? Why it is significant than other tests?
- Q.2 a Explain the term 'Ionization' with reference to breakdown in gases, [10]
- a. Discuss Ionization by collision.
 - b. Photo Ionization.
 - c. Secondary Ionization.
- b Define Townsend's first and second ionization constant. How the condition for breakdown is obtained in Townsend discharge. [10]
- Q.3 a Explain the phenomenon of treeing and tracking in solid insulating materials using electrical stress. How can it be minimized? [10]
- b What is partial discharge? Differentiate between internal and external partial discharge. [10]
- Q.4 a Explain different types of rectifier circuits for producing high DC voltage with suitable waveforms. [10]
- b Why is Cock - Croft - Walton circuit preferred for voltage multiplier circuits? Explain its working with a schematic diagram. [10]
- Q.5 a Explain different methods of high current measurement with relative merits and demerits. [10]
- b With neat diagram explain "Electrostatic Voltmeter". Discuss advantages and limitations for high voltage measurements. [10]
- Q.6 a Write short notes on HV Laboratory layout, grounding and shielding. [10]
- b Describe the various tests carried out on overhead line insulators. [10]
